



Where does Salmonella hide after grinding of meat?

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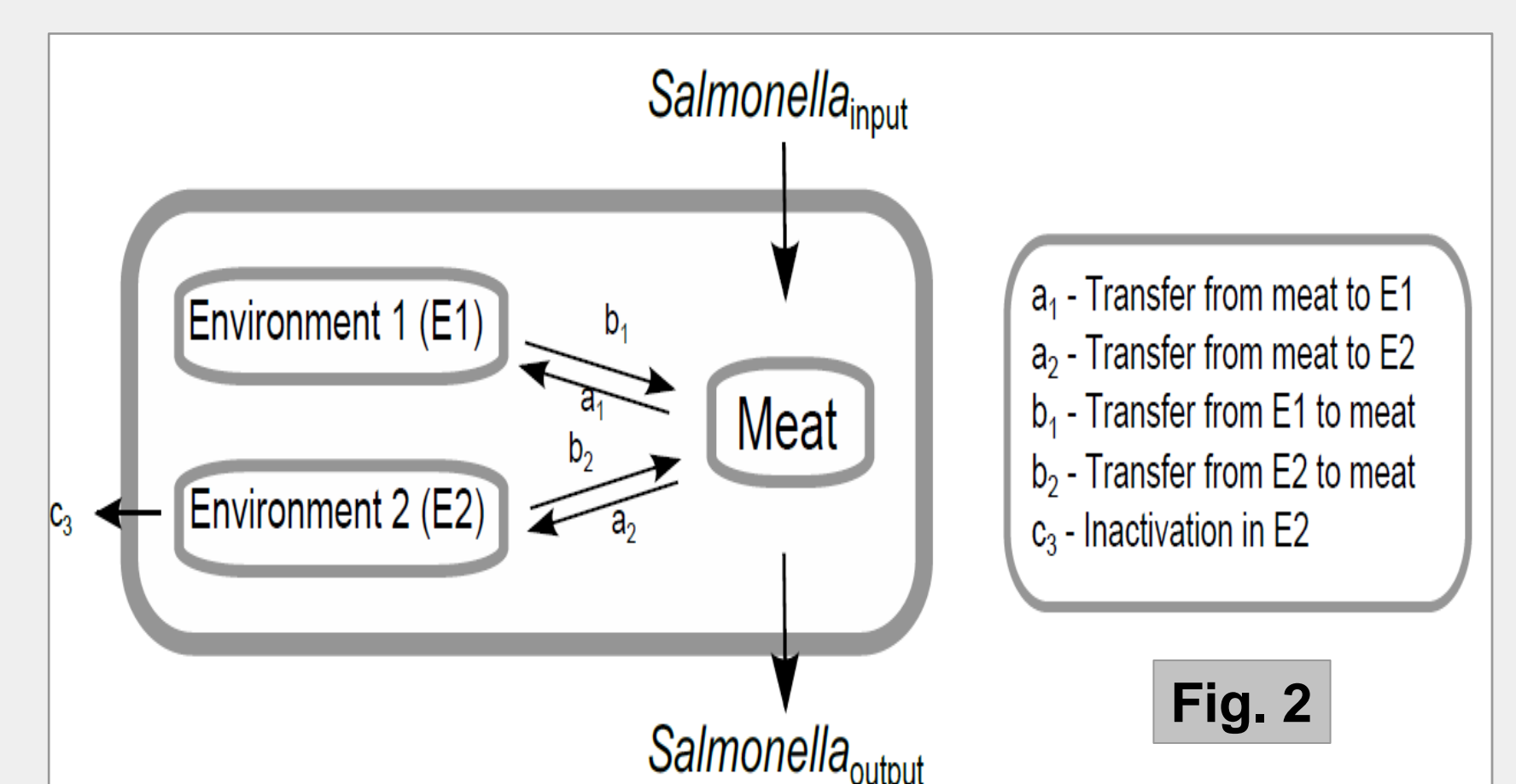
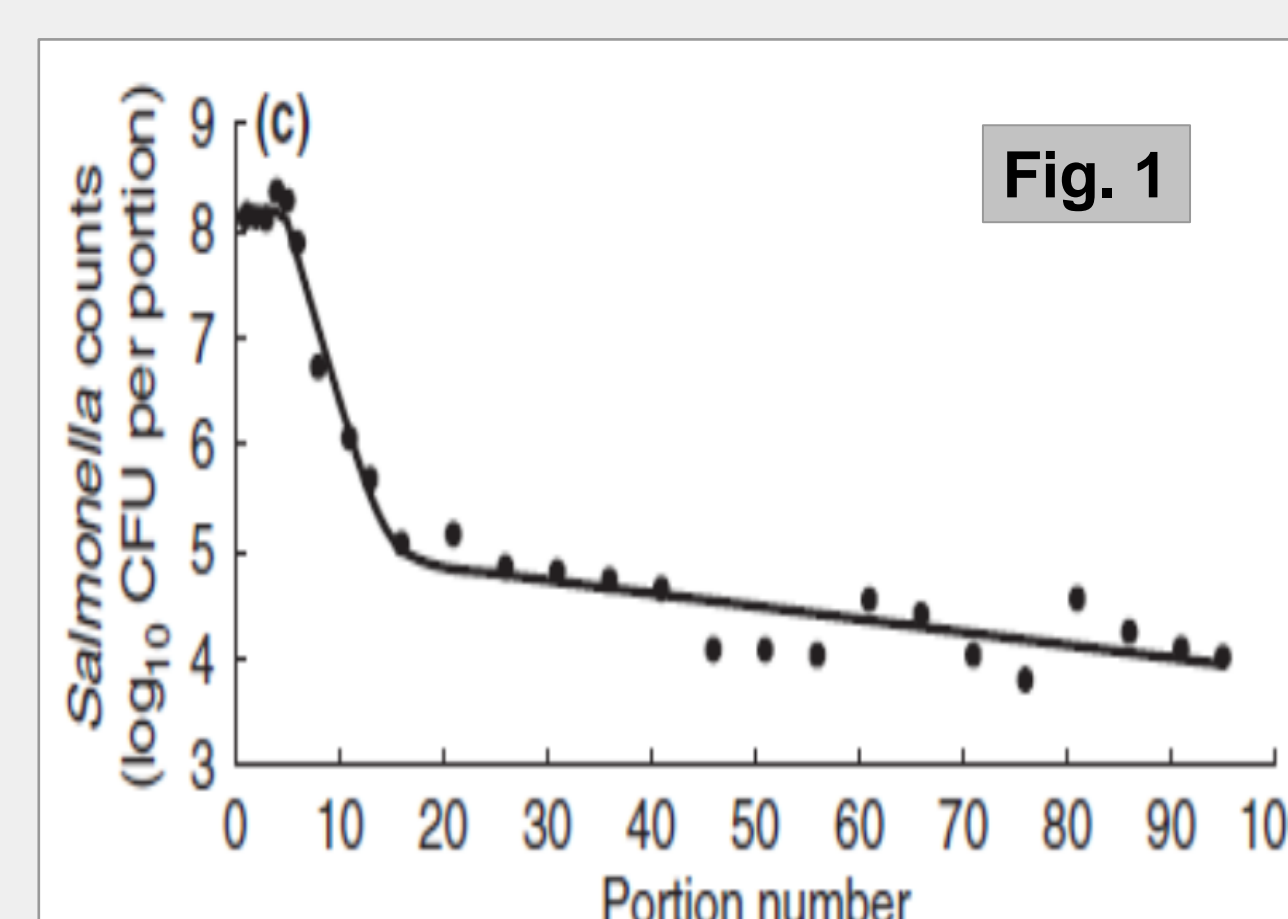
Where does *Salmonella* hide after grinding of meat?

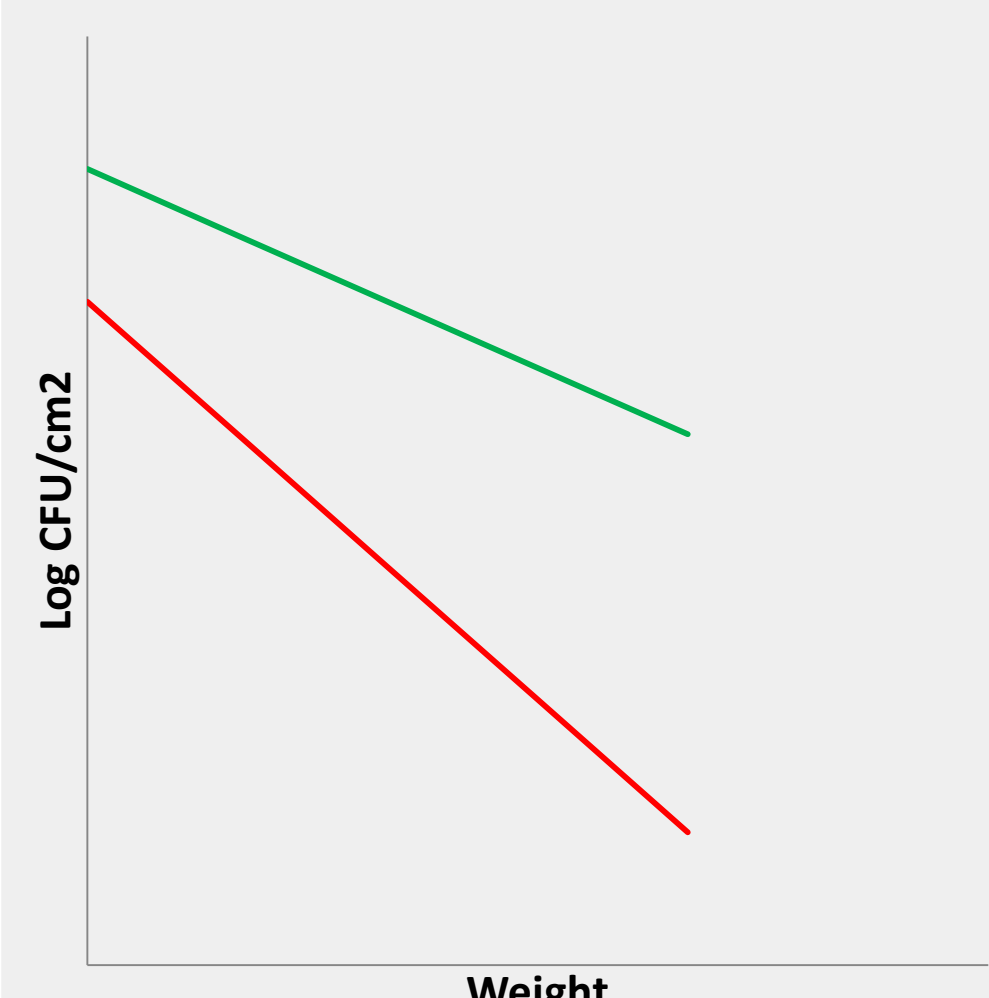
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Background and hypothesis

Transfer of *Salmonella* during grinding of the first pieces of meat decrease rapidly after which the decrease become markedly slower (Fig. 1). This is explained as a biphasic transfer from two distinct environmental loci in the grinder (Fig. 2). In one locus (E1), *Salmonella* is hypothesized to be loosely attached supporting a fast transfer. In another locus (E2), *Salmonella* is hypothesized to be tightly attached making the transfer slow. The objective was to verify this hypothesis.



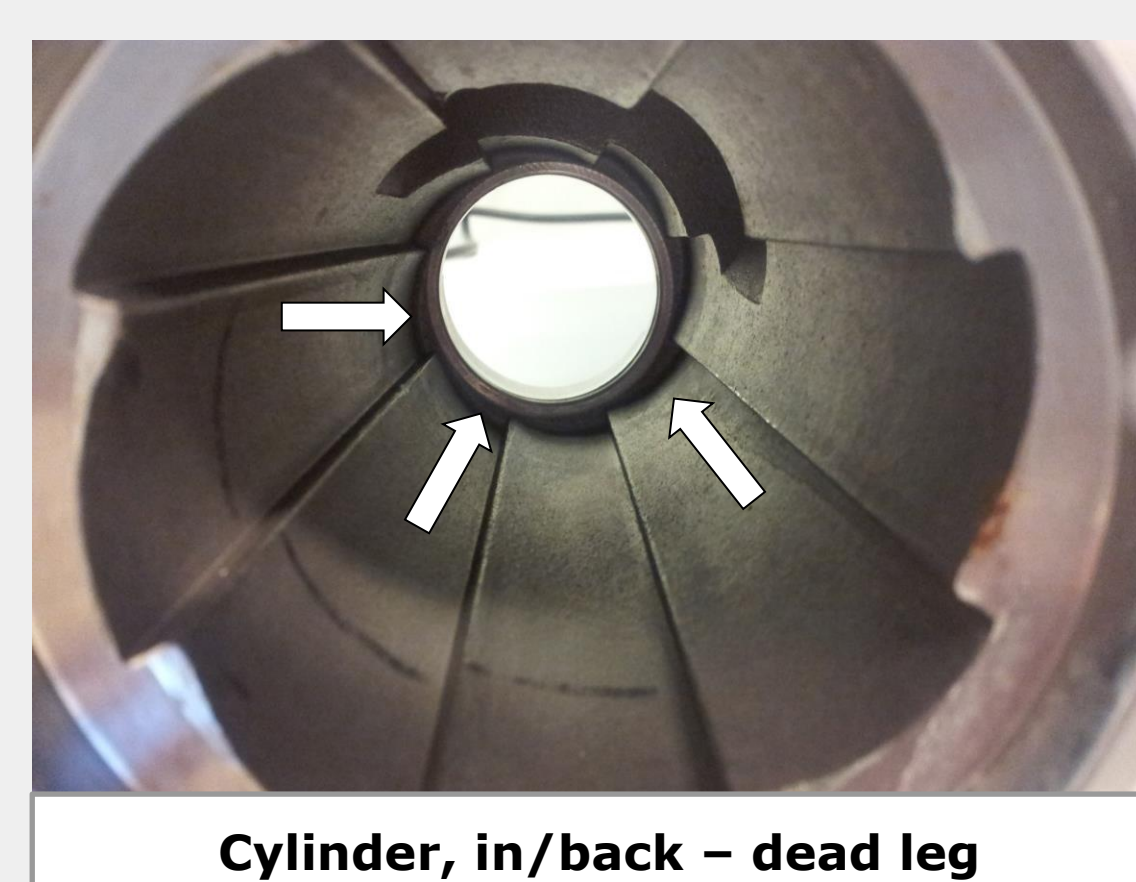
ATTACHMENT – identification of loci in the meat grinder with slow or fast <i>Salmonella</i> transfer		
Grouping of loci based on multiple linear regression analysis		Generic transfer from loci with loose and tight <i>Salmonella</i> attachment
Group 1 (fast)	<ul style="list-style-type: none"> Feed pan Cylinder, out Grinder plate (ring) Grinder plate (knife) Knife Worm 	
Group 2 (slow)	<ul style="list-style-type: none"> Feed pan, out Ring Cylinder, in Cylinder, back 	



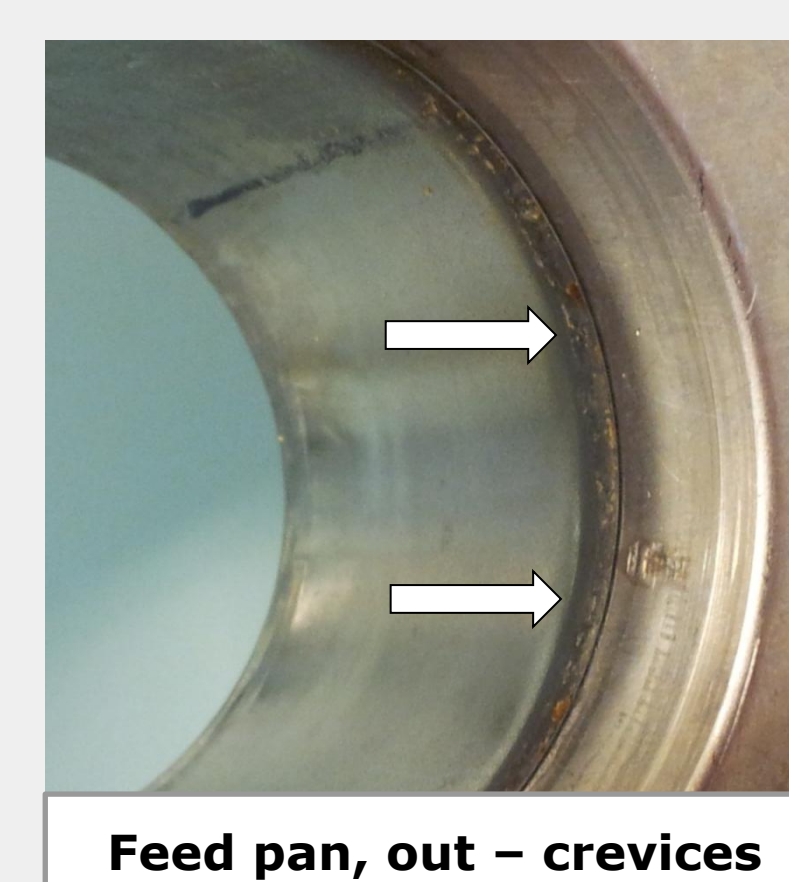
DETACHMENT - number of <i>Salmonella</i> (log CFU/cm ²) recovered from different loci in the meat grinder						
Swabbed loci		Rayon tipped swab method		Toothbrush swab method		t-test, paired (<i>P</i> -value)
		Avg.	S.D.	Avg.	S.D.	
2, 3	Feed pan, out	4.47	0.646	4.62	0.478	0.48
4, 5, 6	Cylinder, out	3.82	0.811	4.43	0.305	0.25
12, 13	Cylinder, in	4.56	0.637	4.92	0.546	0.09
7, 8	Grinder plate, outside	4.27	0.136	4.25	0.270	0.77
9, 10	Grinder plate, inside	3.92	0.683	3.99	0.425	0.78
15, 16	Ring	2.77	0.558	3.06	0.578	0.01

Conclusions – attachment

- Difference between environments likely caused by physical structure
- Irreversible adhesion to the grinder could take place – especially in loci from group 2
- Recovered level of *Salmonella* likely much lower than actual level – dependent on recovery method?



Cylinder, in/back – dead leg



Feed pan, out – crevices

Conclusions – detachment

- Difference between recovery methods depended on physical structure
- Toothbrush swab method recovered higher levels of *Salmonella* – especially in loci from group 2
- Recovered level of *Salmonella* increased 10-fold with the optimized recovery method using toothbrush and mild detergent

